

NOTES ON AUSTRALIAN CRUSTACEA.

No. III.

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(Contribution from the South Australian Museum.)

[Read September 11, 1924.]

ISOPODA-VALVIFERA from South Australia.

The number of species of this tribe listed as occurring in Australian waters is small, and very few have been recorded from our State. There is little doubt that many forms remain to be collected, for, as remarked by Dr. Collinge,⁽¹⁾ "There is no reason to suppose that the South Pacific and Antarctic regions are any poorer in genera and species than the North Pacific and Arctic regions, although few have yet been obtained from the former regions."

Species of five genera not hitherto noted from Australia are herein described. In the specific descriptions the seven visible or "free" segments of the peraeon are referred to as the first to seventh segments, and the appendages of these somites as peraeopods.

Group I. ASTACILLINEA.⁽²⁾

In 1882 Haswell described *Arcturus brevicornis*, from New South Wales, and *A. longicornis*, presumed to be from Tasmania; judging from Haswell's figure the former species should be referred to *Astacilla*. Four years later Beddard added *Arcturus abyssicola* from off North-eastern Australia, etc., and *A. oculatus*, which has been taken in New South Wales and Southern Victoria. Whitelegge, in 1904, described five species—*Arcturus simplicissimus*, *A. dentatus*, *A. alpicornis*, *A. nodosus*, and *A. serrulatus*—dredged by H.M.C.S. "Thetis" in New South Wales waters.

Family ASTACILLIDAE.

Key to Australian Genera.

- | | |
|--|---------------------|
| a. Fourth free peraeon segment much longer than any of the others. | |
| b. First free peraeon segment not fused with cephalon. Pleon composed of two somites, with distinct articulation | <i>Astacilla</i> |
| bb. First free peraeon segment fused with cephalon. Pleon composed of one somite, the articulations fused. | |
| c. Antennae very stout, compressed. Anterior four peraeopods stout, flattened, fringed with strong setae | <i>Parastacilla</i> |
| cc. Antennae moderately stout. Anterior four peraeopods slender, fringed with long, fine hairs | <i>Neastacilla</i> |
| aa. Fourth free peraeon segment not much longer than any of the others | <i>Arcturus</i> |

Parastacilla, n. gen.

Form much as in *Astacilla*. Second antennae raptorial, stout, compressed. Maxillipeds moderately wide, with five-jointed palp and large epipodite. First free peraeon segment fused with cephalon, the lateral parts expanded downwards and forwards and fused to the infero-lateral portion of the head. Anterior four pairs of peraeopods stout, flattened and armed with strong setae. Pleon unisegmentate, with indistinct indications of three fused sutures.

Type *P. truculenta*, n. sp.

(1) Collinge, Journ. Linn. Soc., Zool., xxxiv., 1918, p. 71.

(2) Collinge, loc. cit.

Key to Species.

- a. Peraeon segments without large dorsal spines *truculenta*
 aa. Third and fourth free peraeon segments each with a large dorsal spine *bakeri*

***Parastacilla truculenta*, n. sp.**

Fig. 1.

♀. Cephalon subglobose, dorsally tumid; anterior margin deeply excavate, very slightly produced medianly. Eyes small, subtriangular. First antennae reaching to end of second article of peduncle of second antennae; basal article laterally dilated, second twice as long as third and equal in length to flagellum, which is slender, uniarticulate, and bears sensory appendages at the distal end only. Second antennae large, stout, compressed; first article of peduncle very small; second shorter than third, which is half as long as fourth; fifth article about one-fifth longer than fourth; flagellum short, less than one-third as long as the fifth peduncular segment. Outer lobe of first maxillae capped with nine strong spines and one weaker spine. Maxillipeds with pinnate marginal hairs;

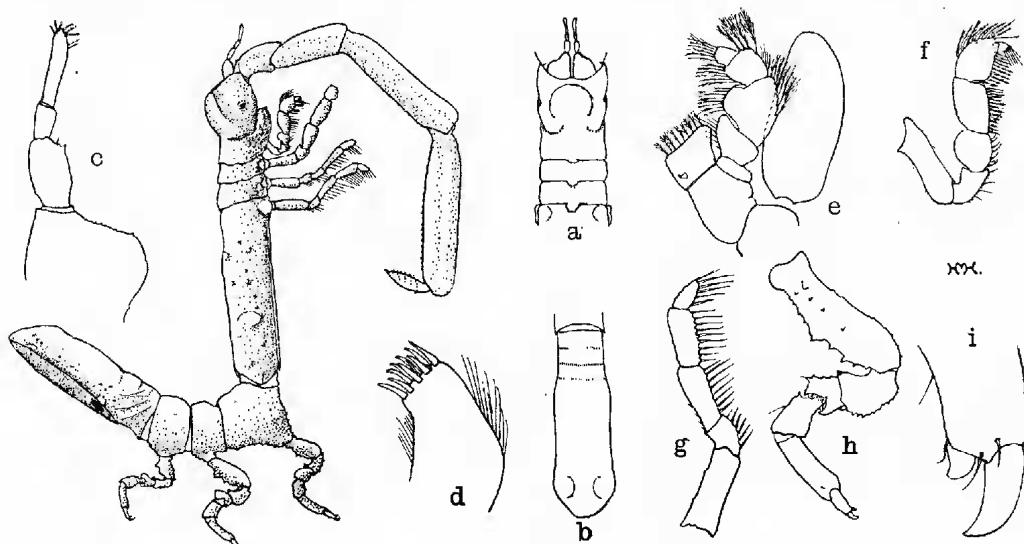


Fig. 1.

Parastacilla truculenta (4 diams.). a, Dorsal view of cephalon and first three peraeon segments (4½ diams.); b, dorsal view of pleon (4½ diams.); c, first antenna (20 diams.); d, outer lobe of first maxilla (40 diams.); e, maxilliped (20 diams.); f, g, and h, first, fourth, and sixth peracopods (10 diams.); i, terminal claws of fifth peracopod (100 diams.).

palp not very elongate, composed of five articles; basipodite shorter than first three articles of palp together, the inner lobe short, not reaching to end of second article of palp and with a row of stiff, pinnate hairs on the almost straight distal margin; epipodite longer and wider than the palp. Peraeon cylindrical, the surface with some small and large scattered warts, and a few small conical spines. Anterior three segments each with a tubercle at middle of posterior margin. Infero-lateral margins of first reaching forwards almost to the level of the eye. Second and third segments subequal in length and fourth more than twice as long as first three together; fifth longer than sixth or seventh. First four pairs of peraeopods stout, flattened; first pair with curved, mostly pinnate or serrulate, marginal setae; second, third, and fourth pairs subequal in length, armed with strong, simple setae. Posterior three pairs prehensile, the last pair a little smaller than either of the others; basal joints armed with blunt, conical

spines; dactyli each with two strong, unequal, curved, apical claws, the smaller of which is less than one-third the length of its fellow. Pleon almost as long as fourth thoracic segment, obtusely-rounded apically; lateral margins tumid at the first third and again near posterior end; surface with small tubercles and a few larger protuberances; a dorsal swelling on each side near posterior marginal tumidities.

Colour, pinkish-brown with antennae and legs pale.

Length, 18.5 mm:

Hab.—South Australia: Beachport, 3-4 fms. (H. M. Hale). (Type, South Aust. Mus., Reg. No. C237.)

This species was dredged up with a mass of weed and was found clinging to a plant of the same colour as itself; it was in the position shown in the figure, clinging to the weed with the three posterior pairs of pereopods.

***Parastacilla bakeri*, n. sp.**

Fig. 2.

Cephalon subglobose, dorsally slightly and roundly elevated. Eyes of moderate size. First antennae reaching a little beyond termination of second article of second antennae; second article about one-fourth longer than third; flagellum rather broad, uniarticulate, more than twice as long as second and third

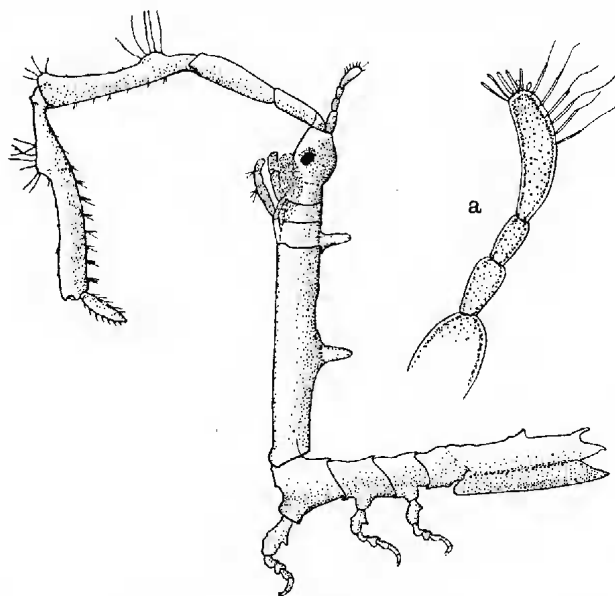


Fig. 2.

Parastacilla bakeri (9 diams.). a, First antenna (33 diams.).

peduncular joints together, and bearing sensory appendages on anterior half of margin. Second antennae large, stout; second article much shorter than third; fourth about one and two-third times as long as third, the dorsal margin elevated near posterior end and again at apex; fifth article one-third longer than fourth, the dorsal margin elevated at the first third of its length; each of the raised bosses is set with long hairs; flagellum short, one-fourth as long as fifth peduncular article. Fourth pereopod segment more than three times as long as first three together; dorsum of third segment with a large, blunt, spine-like projection; a similar projection at middle of length of fourth segment; fifth segment a little longer than sixth, which is longer than the seventh. Posterior three pairs of

peraeopods prehensile, the basos of each with a blunt spine and some smaller spines on inferior margin. Pleon considerably shorter than fourth thoracic segment; with a median, dorsal, conical projection just behind the middle of the length and with a backwardly-produced spine on each side of the mid-line near terminal end.

Length, 9.5 mm.

Hab.—South Australia: Marino Reef (W. H. Baker). (Type, South Aust. Mus., Reg. No. C238.)

Mr. Baker remarks that he found this species some years ago on a "pinkish weed," and that the crustacean was of the same colour when alive; like the foregoing species it was clinging with the posterior thoracic appendages, and carried that part of the body above the geniculation in an erect position. Only a single specimen was taken and, as it is mounted in balsam, it is not possible to accurately figure the legs and other appendages. The anterior peraeopods are crowded together and have become stained; nevertheless, it can be seen that they are stout, as in *P. truculenta*. There is no articulation between the head and first free thoracic segment and the abdomen is unisegmentate.

NEASTACILLA, Tattersall.

Neastacilla, Tatt., "Terra Nova," Zool., iii., 1921, p. 243.

This genus was erected for the reception of *Astacilla falclandica*, Ohlin, and *A. magellanica*, Ohlin. A South Australian species is now added.

Type, *A. falclandica*, Ohlin.

Neastacilla algensis, n. sp.

Fig. 3.

♀. Form slender. Cephalon elongate, much longer than its greatest width; dorsum with a prominent, conical tubercle between eyes; anterior margin deeply and evenly excavate. Eyes moderately large, subtriangular. First antennae reaching almost to posterior fourth of third article of second antennae; basal article stoutest; second stouter than third and equal to it in length; flagellum unarticulate, with sensory appendages on distal half of margin. Second antennae

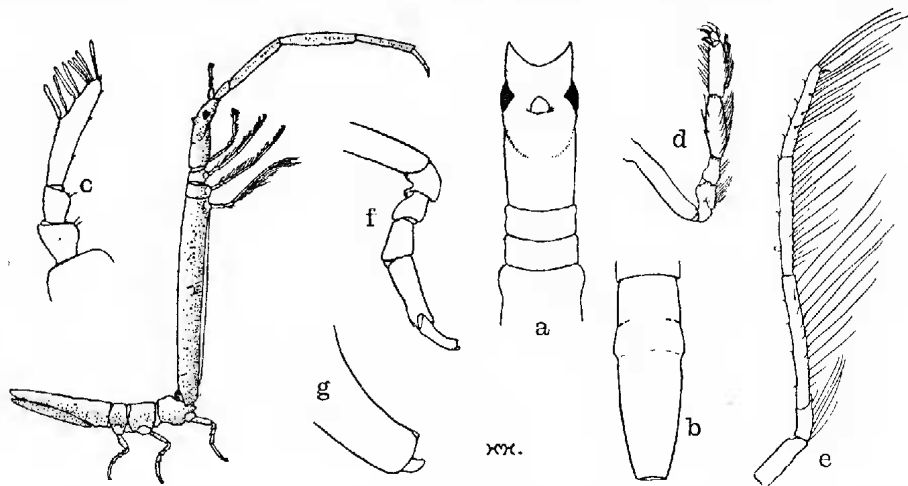


Fig. 3.

Neastacilla algensis (5 diams.). a, Dorsal view of cephalon and first three peraeon segments (10 diams.); b, dorsal view of pleon (10 diams.); c, first antenna (40 diams.); d, e, and f, first, fourth, and fifth peraeopods (20 diams.); g, terminal claws of fifth peraeopod (100 diams.).

subcylindrical, scarcely compressed; first article inconspicuous, not extending past anterior margin of head; second about half as long as head; third longer than fifth and very little shorter than fourth, which is longest; flagellum three-jointed, more than half as long as last article of peduncle. Palp of maxillipeds elongate, composed of five articles. Peraeon a little depressed, with a very obsolete, median, dorsal, longitudinal carina; surface almost smooth. First segment fused with the head; the infero-lateral margins forwardly produced but scarcely expanded downwards; second and third segments subequal in length, with antero-lateral angles prominent; fourth four times as long as first three together and five-twelfths of the total length of animal, exclusive of the antennae; fifth, sixth, and seventh segments decreasing in length backwards, the fifth being nearly twice as long as the seventh. Anterior four peraeopods slender; the first, and shortest, is furnished with fine fringing hairs and bears a flattened, subapical nail, which is serrate on the inner edge; second, third, and fourth appendages with long hairs on the inferior margins, and with the seventh joint represented by a slender nail; the second appendage is longer than the first and shorter than either third or fourth, which are subequal in length. Three posterior pairs somewhat feeble; dactylus of each with a small curved claw and a rudimentary second claw at apex. Pleon one-half as long as the fourth thoracic segment; unisegmentate with indications of two fused sutures, most distinct on sides; surface finely and sparsely punctate; lateral margins roundly prominent in the region of the second fused segment, thence a little curved and converging evenly to the truncate posterior margin.

Colour green, marked with tiny brown chromatophores; each uropod with a brown marking near base and another near apex. Thoracic appendages subhyaline.

Length, 12.25 mm.

Hab.—South Australia: Gulf St. Vincent, 6 miles west of Semaphore, 5-6 fms. (H. M. Hale). (Type, South Aust. Mus., Reg. No. C239.)

A single specimen taken on *Cymodocea antarctica* during a recent dredging excursion of the Field Naturalists' Section. The very long and slender fourth thoracic segment at once separates *N. algensis* from its congeners.

Group II. IDOTEINEA.⁽³⁾

The species previously recorded from Australia are listed below:—

Idotea metallica, Bosc, 1802.

„ *baltica*, Pallas, 1772.

„ *brevicornis*, M. Edwards, 1840, ? = *I. baltica*.

„ *margaritacea*, Dana, 1853, ? = *I. metallica*.

„ *excavata*, Haswell, 1882, ? = *Paridotea unguolata*.

„ *caudacuta*, Haswell, 1882 = *Euidotea peronii*.

Euidotea peronii, M. Edwards, 1840.

„ *stricta*, Dana, 1853.

Paridotea unguolata, Pallas, 1772.

„ „ var. *atrovirens*, Collinge, 1918.

„ (? *Euidotea*) *bakeri*, Collinge, 1917.

Crabyzos longicaudatus, S. Bate, 1863.

„ *elongatus*, Miers, 1876.

No specimens of *Idotea* were found amongst South Australian material, although both *I. baltica* and *I. metallica* have a wide range. *Paridotea unguolata* and *Euidotea peronii* (which are also widely distributed) are the commonest of the species occurring on reefs and in shallow water off our coasts.

⁽³⁾ Collinge, *loc. cit.*

Family IDOTEIDAE.

Key to Australian Genera.

- a. Palp of maxillipeds four-jointed.
 - b. Pleon composed of three segments *Idotea*
 - bb. Pleon composed of not more than two segments *Euidotea*
- aa. Palp of maxillipeds five-jointed.
 - c. Flagellum of second antennae well developed and multiarticulate.
 - d. Coxal plates coalesced with peraeon segments.
 - e. Palp of maxillipeds slender, with the fifth joint subequal in length to fourth; basipodite and epipodite small *Crabysos*
 - ee. Palp of maxillipeds broad, with the fifth joint very much shorter than the fourth; basipodite and epipodite large *Synischia*
 - dd. Coxal plates free on second to seventh free peraeon segments.
 - f. Pleon composed of three segments *Pentidotea*
 - ff. Pleon composed of not more than two segments *Paridotea*
 - cc. Flagellum of second antennae very short, formed of only one to three articles *Zenobiana*

EUIDOTEA, Collinge.

Euidotea, Collinge, Journ. Linn. Soc., Zool., xxxiv., 1918, p. 84.

Type, *Idotea peronii*, M. Edwards.

The diagnosis of *Euidotea* was based upon a single species. It now becomes necessary to somewhat enlarge the limitations of the genus, but it may be noted that similar specific variation occurs in other genera of the family.

Key to Species.

- a. Coxal plates large, those of seventh peraeon segment extending back beyond hinder margin of segment.
 - b. Cephalon with a dorsal tubercle; peraeon longitudinally ridged *bakeri*
 - bb. Cephalon not dorsally elevated; peraeon not longitudinally ridged *peronii*
- aa. Coxal plates small, those of seventh peraeon segment not nearly reaching to hinder margin of segment *stricta*

EUIDOTEA PERONII, M. Edwards.

Idotea peronii, M. Edw., Hist. Nat. Crust., iii., 1840, p. 133; Chilton, Trans. N. Z'd. Inst., xxii., 1890, p. 199 (part).

Idotea distincta, Guér. Méneville, Icon. Règne Anim., 1829-1844, Crust., p. 33.

Idotea caudacuta, Hasw., Proc. Linn. Soc. N.S. Wales, vi., 1882, p. 181, pl. iv., fig. 4.

Paridotea peronii, Stebbing, Ann. S. Afr. Mus., vi., 1910, p. 433.

Euidotea peronii, Collinge, loc. cit. (syn.).

Fig. 4, e, f, and g.

Common on South Australian coasts. As noted by Haswell the colour is extremely variable; in large examples the body is very convex and the posterior coxal plates are subtriangular in shape.

Collinge describes the pleon as "composed of a single segment and three lateral sutures." In a not inconsiderable series of South Australian specimens, the first suture is complete, thus marking off a short basal segment just as in the example figured by Miers⁽⁴⁾; the two segments are, however, not articulate. Chilton states that this suture is variable in *E. peronii* and *Paridotea unguolata*.

EUIDOTEA STRICTA, Dana.

Idotea stricta, Dana, U.S. Expl. Exped., xiv., Crust., ii., 1853, p. 704, pl. xlvi., fig. 7; Miers, Journ. Linn. Soc., Zool., xvi., 1881, p. 62.

Idotea peronii, Chilton, Trans. N. Z'd. Inst., xxii., 1890, p. 199 (part).

Fig. 4, a, b, c, and d.

This species superficially resembles *E. peronii*, but a comparison of examples of both forms, of the same size and sex, shows that *E. stricta* differs in the following characters:—

(4) Miers, Journ. Linn. Soc., Zool., xvi., 1881, pl. ii., fig. 6.

Form more elongate. Dorsum of cephalon roundly elevated. Flagellum of second antennae composed of a lesser number of articles. Coxal plates small, none of them reaching to the posterior margins of the peraeon segments. Pleon unisegmentate, with three pairs of short lateral sutures near base.

Hab.—New South Wales (Dana); South Australia: Gulf St. Vincent, 6-7 fms. (H. M. Hale), Kangaroo Island (W. H. Baker).

Chilton regards *E. stricta* as "specimens of *I. peronii* in which the two segments of the postabdomen have more or less completely coalesced." In describing *E. stricta*, however, Dana remarks: "Epimerals very small. . . . This narrow species has the epimerals occupying only part of the margin of each segment." In fig. 4 (*b* and *c*), a female of *E. peronii* 15 mm. in length is drawn for comparison with an ovigerous female of *E. stricta* 15.5 mm. in length; in larger examples the difference in the relative size of the coxal plates is more marked. Even in specimens of *E. peronii* 6 mm. in length the last pair of coxal plates

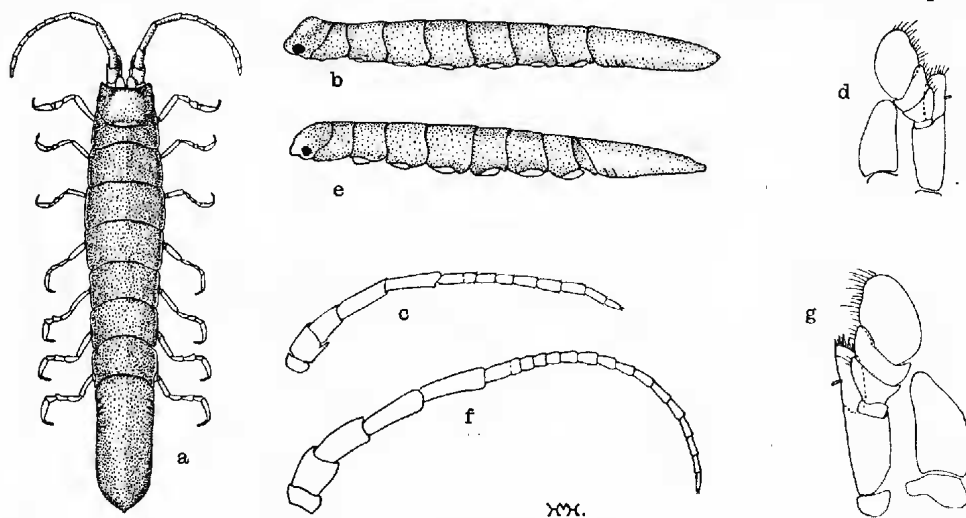


Fig. 4.

Euidotea stricta. *a*, Dorsal view ($3\frac{1}{2}$ diams.); *b*, lateral view ($3\frac{1}{2}$ diams.); *c*, second antenna (5 diams.); *d*, maxilliped (16 diams.). *Euidotea peronii*. *e*, lateral view ($3\frac{1}{2}$ diams.); *f*, second antenna (5 diams.); *g*, maxilliped (16 diams.).

extend back to the level of the hinder margin of the segment, but in an example of *E. stricta* 20 mm. in length they do not nearly reach to the posterior margin. The type of the species is approximately 22 mm. in length.

EUIDOTEA BAKERI, Collinge.

Paridotca bakeri, Collinge., Journ. Zool. Research, ii, 1917, p. 112 (? part), pl. vi., figs. 1-3 and 6-8.

Fig. 5.

♂. Form moderately stout, four and one-half times as long as greatest width. Cephalon about twice as wide as long, narrower than the first peraeon segment, distinctly elevated dorsally and with a transverse groove near hinder margin; antero-lateral angles prominent; eyes of moderate size, situate dorso-laterally on slight elevations. First antennae reaching to middle of third peduncular article of second antennae; first article expanded; third about twice as long as second and subequal in length to the single-jointed flagellum. Second antennae stout and rather short, reaching to posterior margin of fourth peraeon segment; first article short, well visible in dorsal view; second and third subequal

in length, each stouter than, and more than one-half as long as fourth and fifth, which are subequal in length; flagellum shorter than peduncle, composed of seven articles and a minute terminal style; first and ultimate articles subequal in length and longer than any of the others; second to penultimate gradually increasing in length. Outer lobe of first maxillae capped with ten strong spines, four of the innermost of which are denticulate; inner lobe with three setose spines. Maxillipeds broad and stout, with four-jointed palp. Basipodite as long as terminal segment of palp; inner lobe moderately wide, with strong spines at distal end. Epipodite large, much longer than basipodite and first joint of palp together. Each peraeon segment strongly ridged on the longitudinal, median line, and with an oblique elevation, followed by a depression, midway between mid-line and lateral margins on each side. First segment a very little wider anteriorly than posteriorly; laterally forwardly produced to surround the posterior half of the head; anterior edges of lateral portions obliquely truncate; length at sides more than twice medial length. Second to sixth segments of equal length. First and seventh segments subequal in medial length, not much more than one-half as long as any of the others. Coxal plates of second to seventh segments

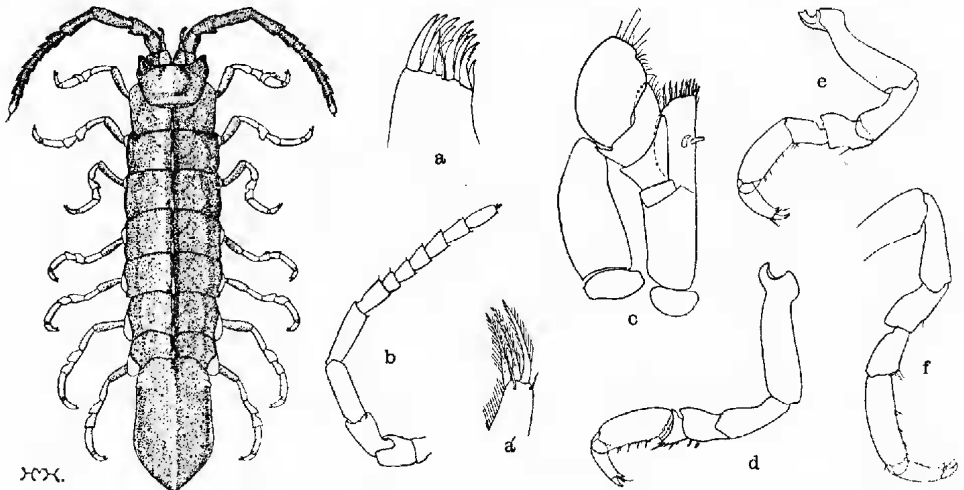


Fig. 5.

Euidotea bakeri (5 diams.). *a*, Terminal part of outer lobe and (*a*) of inner lobe of first maxilla (60 diams.); *b*, second antenna (8 diams.); *c*, maxilliped (32 diams.); *d*, *e*, and *f*, first, fourth, and seventh peraeopods (16 diams.).

conspicuous in dorsal view, none of them extending along the whole length of its segment; those of second to fourth small, rounded and placed in advance of the middle of the lateral margins of their segments; fifth to seventh increasing in size backwards; the fifth do not reach to the posterior margin of their segment; the sixth extend almost to the posterior margin; while the seventh pair are lobular, and reach back beyond the hinder edge of the segment. Anterior margin of each sternal segment with a row of rugose tubercles. Peraeopods slender. Pleon wide, with a longitudinal, median carina; unisegmentate, with three pairs of lateral sutures near base; lateral margins gently concave for anterior half, thence rounded and suddenly converging to the obtusely angular apex. Uropoda moderately elongate; endopodite narrowly and obliquely subtruncate at apex.

Colour pinkish-brown, with a black median stripe on peraeon; peraeopods yellowish, excepting on basos; antennae yellow on distal half of ultimate segment. Underside paler.

Length, 11 mm.

Hab.—South Australia: "Adelaide" (type loc.), Kangaroo Island, Marino Reef (H. M. Hale), Port Willunga Reef (S. S. Stokes).

An example 7 mm. in length is much darker in colouration, being almost black above and sooty beneath; in this specimen the flagellum of the second antennae consists of four articles and a terminal style. In the largest available male (21 mm.) the flagellum is eleven-jointed, and in a female of the same size is ten-jointed. The lateral sutures of the pleon arc situated very close to the base, and the first, or anterior pair, is partly hidden by the posterior coxal plates.

As in *E. peronii*, the seventh coxal plates reach beyond the hinder angles of the last peraeon segment, but they are rounded and not apically angulate; the stouter maxillipeds and antennae, and the sculpture of the dorsal surface further distinguish *E. bakeri* from the last-named species.

I had previously described and figured this species in MS. as a new member of the genus *Euidotea*, not connecting it with *Paridotea*. Since the MS. was sent to press I received, through the courtesy of Dr. Collinge, the paper quoted above, and have made some tentative alterations in the nomenclature, but have let the descriptive details, as given above, stand. The specimens now described approximate very closely to Collinge's description of *Paridotea bakeri*, excepting as regards the maxillae and maxillipeds, which are very different; I venture to suggest that a re-examination of the type specimens may show that the mouth parts described for them belong to another species.

CRABYZOS, Spence Bate.

Crabyzos, S. Bate, Proc. Zool. Soc., 1863, p. 504; Collinge, Journ. Linn. Soc., Zool., xxxiv., 1918, p. 71.

Type, *C. longicaudatus*, S. Bate.

In this well-defined genus the cephalon is usually partly fused with the first "free" peraeon segment. The coxal plates are coalesced in all the segments, and the coxopodites are well developed beneath, forming sockets in which the basos of the peraeopods articulate.

The form, at least in the male, is very elongate, and the mouth parts and uropods are correspondingly long and narrow. The terminal joint of the maxillipeds is relatively longer than in other genera of the family with five-jointed palp, while the basipodite and epipodite are small.

Collinge points out that *Idotea elongata*, Miers, should be referred to *Crabyzos*; this author⁽⁵⁾ also mentions that he has examined two new species from South Australia, and promises a revision of the genus.

Key to Species.

a. Pleon acuminate at apex	<i>longicaudatus</i>
aa. Pleon incised at apex	<i>elongatus</i>

CRABYZOS LONGICAUDATUS, Spence Bate.

Crabyzos longicaudatus, S. Bate, loc. cit., p. 504, pl. xli., fig. 7; Hasw., Cat. Austr. Crust., 1882, p. 278.

Idotea longicaudata, Miers, Journ. Linn. Soc., Zool., xvi., 1883, p. 63; Hasw., Proc. Linn. Soc. N.S. Wales, ix., 1885, p. 1001.

Fig. 6.

This species is moderately common amongst the "sca-grasses" growing in 3 to 6 fathoms in Gulf St. Vincent; the crustacean admirably matches the green leaves of the weed in colour.

Specimens before me differ from Spence Bate's figure in that the first antennae do not quite reach to the distal end of the third article of the second

⁽⁵⁾ Collinge, loc. cit.

antennae, and the first peraeopods are not markedly longer than the last pair. The first pair are long, and stouter than any of the others; the second to fourth

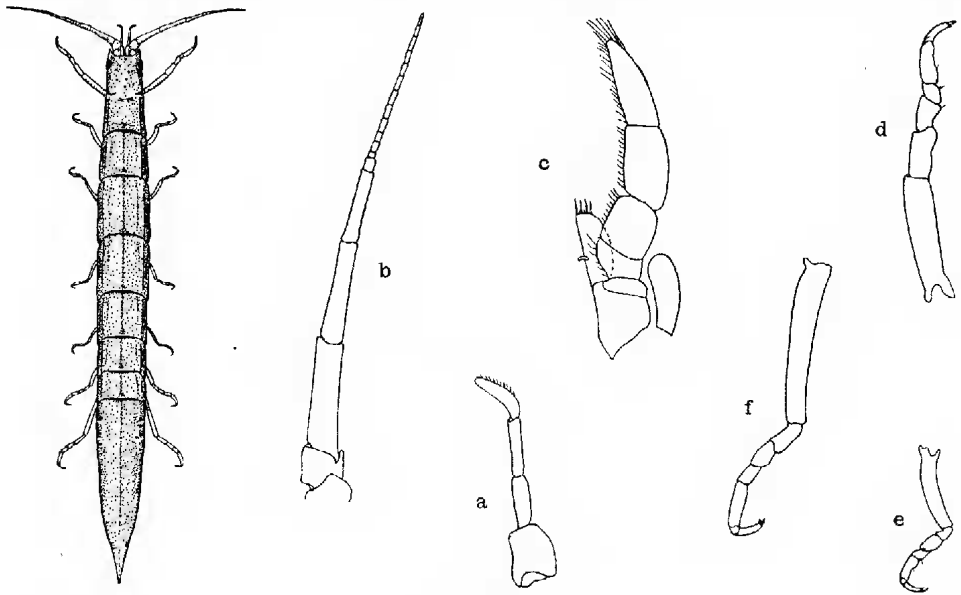


Fig. 6.

Crabyzos longicaudatus ($1\frac{3}{4}$ diams.). *a*, First antenna (8 diams.); *b*, second antenna (5 diams.); *c*, maxilliped (16 diams.); *d*, *e*, and *f*, first, fourth, and seventh peraeopods (5 diams.).

decrease rapidly in size, the fourth pair being scarcely more than one-half as long as the first; the remaining pairs increase in length posteriorly. In the seventh pair the basos is very long and the total length of these peraeopods is slightly greater than that of the first pair.

The dorsum of the peraeon is but slightly convex transversely, and the pleura form almost a right angle with the back. The pleon is unisegmentate, with faint indications of two pairs of lateral sutures.

The example figured above is an ovigerous female 49 mm. in length; in smaller specimens the peraeon is scarcely wider than the head, with the sides subparallel, and the pleon is more acuminate.

Hab.—South Australia: Gulf St. Vincent.

CRABYZOS ELONGATUS, Miers.

Idotea elongata, Miers, Ann. Mag. Nat. Hist. (4), xvii., 1876, p. 225; Chilton, Trans. N. Z'd. Inst., xxii., 1889, p. 198 (syn.).

Crabyzos elongatus, Collinge, Journ. Zool. Research, i., 1916, p. 119.

Hab.—New Zealand; South Australia (*vide* Collinge, *ut supra*).

Synischia, n. gen.

Form narrow, flattened. Flagellum of second antennae slender, multi-articulate. Maxillipeds stout, with five-jointed palp, the last joint small; basipodite and epipodite large. Peraeon with a longitudinal, median ridge; all coxal plates perfectly fused with their segments. Pleon composed of a single segment, and with three pairs of short lateral sutures near base.

Type, *S. levidensis*, n. sp.

This genus differs from *Crabysos* in the very different form of the maxillipeds, in the subhorizontal pleura of the peraeon segments and in having three pairs of distinct lateral sutures on the pleon.

Two other Idoteid genera, *Edotea*, Guérin Méneville and *Synidotea*, Harger, have the coxal plates perfectly united with the peraeon segments. Both of these genera differ from *Synischia* in having the palp of the maxillipeds three-jointed.

***Synischia levidensis*, n. sp.**

Fig. 7.

♂. Form slender, six times longer than greatest width. Cephalon short and flat, not very convex dorsally; nearly twice as wide as medial length and distinctly narrower than the first peraeon segment; anterior margin concave; lateral margins slightly converging anteriorly. Eyes moderately large, situated dorso-laterally, and completely visible in dorsal view. First antennae reaching beyond second article of second antennae; basal joint expanded, longer than third, which is longer than the second, and subequal in length to the single-jointed flagellum. Second antennae slender, reaching back almost to posterior margin of fourth peraeon segment; first article short, visible in dorsal view; second and

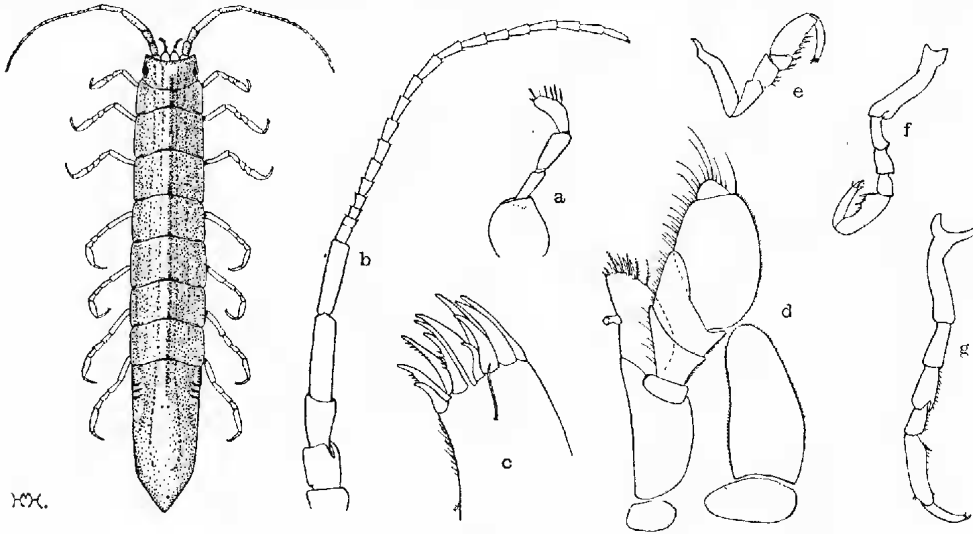


Fig. 7.

Synischia levidensis (3 diams.). a, First antenna (16 diams.); b, second antenna (8 diams.); c, terminal part of outer lobe of first maxilla (80 diams.); d, maxilliped (32 diams.); e, f, and g, first, fourth, and seventh peraeopods (8 diams.).

third subequal, together equal in length to fourth, which is longer than the fifth article; flagellum about one-half as long again as peduncle, composed of eighteen articles and a minute terminal style. Outer lobe of first maxilla capped with eleven strong spines, three of the innermost being denticulate. Maxillipeds broad, with five-jointed palp; basipodite stout, a little shorter than the epipodite; distal end of inner lobe with six strong, simple spines and some longer, slender, pinnate spines. Dorsum of peraeon roof-shaped, longitudinally medianly ridged, widest at last segment; first segment medianly short, distinctly less than half as long as second to fifth segments, which are equal in length; sixth and seventh of equal length, a little shorter than second to fifth segments. Coxal plates all fused with their segments, the junction being indicated by faint and indistinct depressions. Peraeopods rather feeble, increasing in length posteriorly, the first pair shortest. Pleon about as long as first four peraeon segments together, with a

longitudinal, median ridge on anterior fourth of its length, the remainder obsoletely carinate; composed of one segment, and with three pairs of lateral sutures; widest on anterior margin and with lateral margins slightly converging posteriorly for three-fourths of their length, thence suddenly converging to the acute apex. Uropoda narrow, with posterior margin truncate; endopodite apically narrowly rounded, subtruncate.

Colour very pale brown, speckled and longitudinally streaked with darker brown. Cephalon with a black, submarginal streak passing through each eye.

Length, 21 mm.

Hab.—South Australia: Gulf St. Vincent, 6 miles north-west of Outer Harbour, 6-7 fms. (H. M. Hale). (Type, South Aust. Mus., Reg. No. C242.)

A single specimen dredged from amongst *Cymodocea*.

PENTIDOTEA, Richardson.

Pentidotea, Richardson, Bull. U.S. Nat. Mus., liv., 1905, p. 368.

Type, *Idotea resecata*, Stimpson.

***Pentidotea australis*, n. sp.**

Fig. 8.

♂. Form narrow, elongate, about six and one-half times as long as greatest width. Dorsum very convex. Surface smooth. Cephalon wider than long, much narrower than first peraeon segment; anterior margin almost straight in middle portion, very slightly convexly sinuate, laterally produced obliquely forwards to the angularly rounded antero-lateral angles. Eyes moderately large, well visible in dorsal view. Peduncle of first antennae reaching to end of second

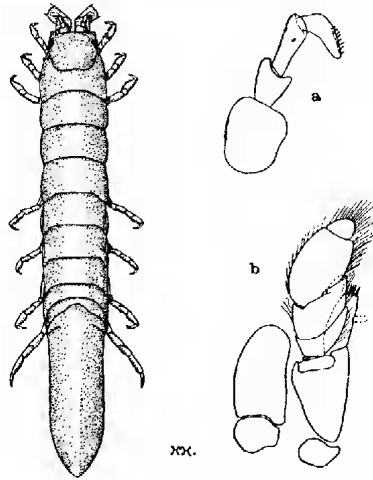


Fig. 8.

Pentidotea australis (1 1-10th diams.).

a, First antenna (6 diams.);

b, maxilliped (6 diams.).

article of second antennae; first article large and dilated, a little longer than its greatest width; second article much wider and shorter than third, which is a little shorter than the first; flagellum subequal in length to last peduncular article. First article of peduncle of second antennae visible in dorsal view, one-half as long as second article, which is longer than the third; remainder missing. Maxillipeds with five-jointed palp; basipodite subequal in length to the epipodite inner lobe with some strong, simple spines at distal end. First peraeon

segment much narrower anteriorly than posteriorly, the lateral margins roundly converging; antero-lateral angles forwardly produced, surrounding the posterior part of the head to the level of the eyes; the medial length of this segment is much less than that of any of the others; second to sixth segments subequal in length; seventh a little shorter. Coxal plates in second and third segments elongate, less than half the length of the lateral margin; in the fourth about half the length of lateral margin; in the fifth, sixth, and seventh segments they are wider, slightly visible in dorsal view and almost as long as the lateral margins. Peraeopods strong, the anterior three pairs directed forwards, the others backwards; first pair stouter than second, third, or fourth, which are subequal in length; posterior three pairs successively increasing in size backwards, the seventh pair being one-third the length of the animal. Pleon as long as the first six peraeon segments together; first segment medianly longer than second; lateral margins of terminal segment subparallel for anterior two-thirds, thence narrowly converging to the subacute apex. Uropoda long and narrow; endopodite emarginate at apex.

Colour completely bleached after long preservation in alcohol.

Length, 51 mm.

Hab.—South Australia: Kangaroo Island. (Type, South Aust. Mus., Reg. No. C234.)

A single, mutilated specimen with the mouth parts of one side missing. The narrow, elongate form is distinctive for this species, which somewhat superficially resembles *P. rotundata*, Rich., from Japan. In the last-named species, however, the eyes are very small, the head is scarcely narrower than the first thoracic segment, the maxillipeds are different, and the abdomen is less narrowed posteriorly.

PARIDOTEA, Stebbing.

Paridotea, Stebb., S. Afr. Crust., i., 1900, p. 52; Chilton, Subant. Is. N. Z'd., ii., 1909, p. 660; Barn., Ann. S. Afr. Mus., x., 1914, p. 424.

Type, *Idotea unguolata*, Pallas.

Key to Australian Species.

- a. Third article of first antennae distinctly longer than second. Inner lobe of first maxillae capped with four setose spines. Anterior margin of endopodite of uropoda not, or scarcely, oblique *ungulata*
- aa. Second and third articles of first antennae subequal in length. Inner lobe of first maxillae capped with three setose spines. Anterior margin of endopodite of uropoda distinctly oblique *munda*

PARIDOTEA UNGULATA, Pallas.

- Oniscus unguolatus*, Pallas, Spicil. Zool., ix., 1772, p. 62, pl. iv., fig. 11.
- Idotea lalandii*, M. Edw., Hist. Nat. Crust., iii., 1840, p. 132, pl. xxxi., fig. 7.
- Idotea affinis*, M. Edw., loc. cit., p. 133.
- Idotea edwardsii*, Guér.-Ménéville, loc. cit., p. 33.
- Idotea nitida*, Heller, Verhandl. Zool.-Bot. Ges. Wien, 1861, p. 497.
- ? *Idotea excavata*, Hasw., loc. cit., p. 182.
- Paridotea unguolata*, Stebb., loc. cit., p. 53; Nierstrasz, Zool. Meded., iii., 1917, p. 113, figs.; Cllnge., Journ. Linn. Soc., Zool., xxxiv., 1918, p. 81 (syn.).

Fig. 9, e and f.

This widely distributed species is common in the shallow waters of South Australia.

Paridotea munda, n. sp.

Fig. 9, a to d.

♂. Form slender, more than five times longer than greatest width. Sides parallel, surface smooth and dull. Cephalon about one and three-fourths times wider than long, narrower than the first peraeon segment, evenly convex dorsally;

anterior margin sinuate, slightly incised medianly; antero-lateral angles not prominent; postero-lateral margins converging posteriorly; eyes moderately large, situate dorso-laterally, on slight elevations. First antennae reaching to middle of fourth peduncular article of second antennae; first article subglobose, longer than second or third (which are subequal in length), and as long as the single-jointed flagellum. Second antennae slender, reaching back to posterior margin of fourth peraeon segment; first article very short; second and third articles subequal in length, shorter than fourth and fifth, which are subequal in length; flagellum more than twice as long as peduncle, composed of twenty-two articles and a terminal style. Outer lobe of first maxilla narrow, capped with nine strong spines; inner lobe with three setose spines. Maxillipeds clongate, with five-jointed palp. Basipodite as long as the two terminal segments of palp together; inner lobe narrow, with slender spines at distal end. Third joint of palp forwardly produced at inner apex. Epipodite narrow, very slightly curved inwards apically; longer than the basipodite and first joint of palp together. First peraeon segment widest anteriorly, where the pleura are

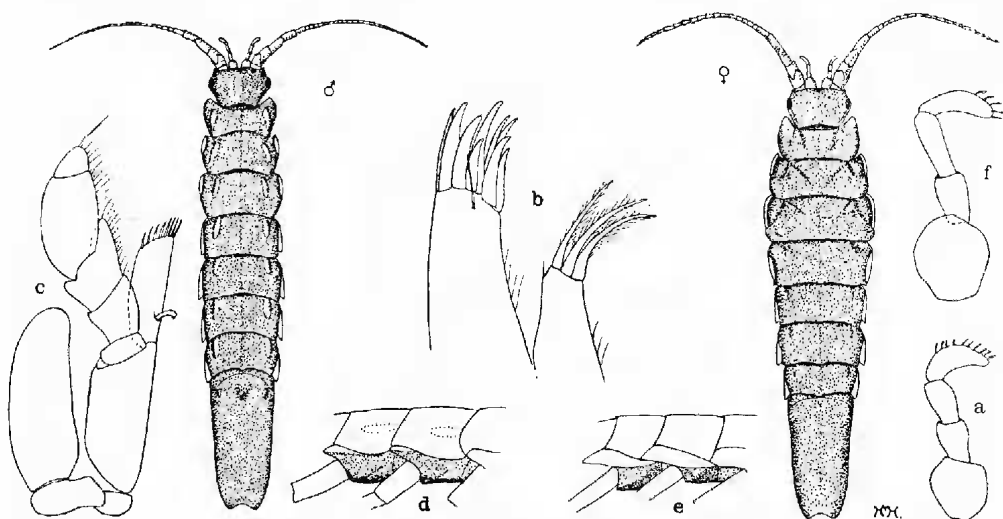


Fig. 9.

Paridotea munda, male (left) and female (right) (3½ diams.). a, First antenna (16 diams.); b, first maxilla (80 diams.); c, maxilliped (32 diams.); d, lateral view of sixth and seventh peraeon segments (5 diams.). *Paridotea unguolata*, e, lateral view of sixth and seventh peraeon segments (4 diams.); f, first antenna (16 diams.).

produced outwards and forwards, but do not embrace base of head; anterior and posterior margins concave. Second to seventh segments subequal in length, the second and last a little shorter than the others. Second segment slightly, forwardly produced at anterior lateral angles, and with coxal plates occupying anterior half of lateral margins. Coxal plates of third segment rather more than one-half as long as lateral margins, of fourth almost as long as, of fifth equal in length to, and of last segment longer than, lateral margins. Peraeopods slender, without fur on inner margins. Pleon narrow, medial length about twice basal width; about one-half as long as peraeon; unisegmentate, with a very faint complete suture line near base, followed by two pairs of short, indistinct lateral sutures; gradually tapering from base to apex, which is evenly, concavely incised, with postero-lateral angles rounded. Uropoda narrow, posterior margin oblique; apex of endopodite truncate, a little concave.

Colour pinkish-brown, with a pale elongate spot, outlined in black, at each side of peraeon segments. A black streak extending from hinder edge of eye to base of cephalon. Antennae and peraeopods very pale yellowish, minutely dotted with brown. Uropoda with anterior half of inner margin bordered with black.

Length, 16 mm.

Ovigerous female. Second antennal flagellum composed of nineteen articles. Second to fifth segments of peraeon widened, the third the widest; antero-lateral portions of second to fourth segments tumid.

Colour yellowish-green, with a blackish marking on each side of peraeon segments. A black streak behind eye. Marsupial plates with a conspicuous black spot at base.

Length, 14.5 mm.

Hab.—South Australia: Marino Reef (type loc., H. M. Hale), Port Willunga (S. S. Stokes); Tasmania (A. M. Lea). (Type male, Reg. No. C249, and allotype female, C250, in South Australian Museum.)

Females without ova are narrow in form, and in this sex the pleura of the first peraeon segment occasionally partly embrace the base of the head. In a few specimens the pleon is much more deeply incised at the apex than in the type. The largest example available is 22 mm. in length.

This species may be separated from *P. unguolata* by the following characters:—The outer lobe of the first maxilla is narrower and is capped with a lesser number of spines, while the inner lobe bears only three setiferous spines; the epipodite of the maxillipeds is of different shape. The coxal plates, when viewed laterally (*cf.* fig. 9, *d* and *e*), are different, and the articles of the first antennae are of different proportions (fig. 9, *a* and *f*). In *P. unguolata* the apical notch of the pleon is broadly angulate or sinuate, with acute postero-lateral angles. *P. munda* is apparently allied to *P. fucicola*, Barn., from South Africa, but in the last-named species the fourth to seventh peraeopods have "thick fur on inner margin of fourth to sixth joints."⁽⁶⁾ Barnard's figure shows that in *P. fucicola* the head is not narrower than the first peraeon segment and the terminal notch of the pleon is very small, while the mouth parts, which are figured by Collinge,⁽⁷⁾ are somewhat different.

ZENOBIANA, Stebbing.

Zenobia, Risso, Hist. Nat. de l'Europe Mérid., v., 1826, p. 110.

Cleantis, Dana, Amer. Journ. Sci. and Arts (2), viii., 1849, p. 427.

Zenobiana, Stebbing, Ann. Mag. Nat. Hist. (6), xv., 1895, p. 24; Collinge, Trans. Roy. Soc., Edinburgh, li., 1917, p. 749 (syn.).

Type, *Zenobia prismatica*, Risso.

Zenobiana phryganea, n. sp.

Fig. 10.

♂. Form narrow, elongate, nearly six times as long as greatest width; surface of head and thorax obscurely pitted and scratched; surface of abdomen with shallow but distinct pits. Width of cephalon one-half as long again as medial length; width at anterior margin equal to that at base; anterior margin slightly concave, posterior margin convex; eyes moderately large, situated dorso-laterally. First antennae stout, very short, extending a little beyond second

⁽⁶⁾ Barn., Ann. S. Afr. Mus., x., 1914, p. 427, pl. xxxvi. E.

⁽⁷⁾ Collinge, *loc. cit.*, p. 84, pl. viii., figs. 30, 31.

article of second antennae; basal article stout, longer than wide; second and third subequal in length, together as long as the first; flagellum wide, apically rounded, longer than second or third peduncular articles. Second antennae short, not as long as head and first two thoracic segments together; first article small, and fifth a little longer than second or fourth, which are subequal in length; third article considerably shorter than second; flagellum composed of one article, tapering, scarcely longer than last article of peduncle. Maxillipeds moderately elongate, with five-jointed palp; basipodite scarcely longer than the first three articles of palp together, the inner lobe with some curved, pinnate spines at distal end; epipodite large, narrowed towards apex. Sides of peraeon parallel; first segment medianly the shortest, a little shorter than the second; fourth, fifth, and sixth segments subequal in length, longer than second, third, or seventh

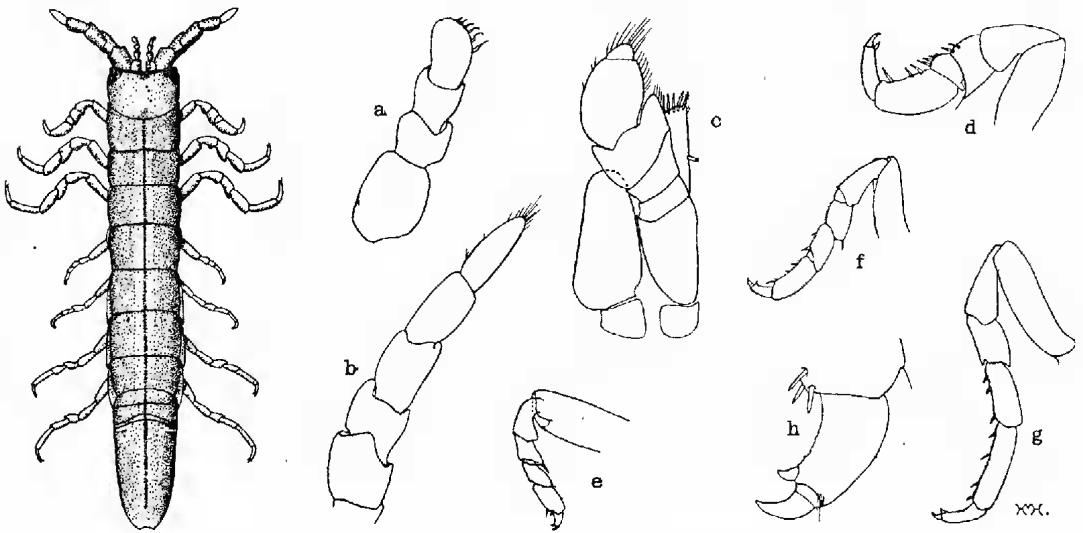


Fig. 10.

Zenobiana phryganea (5 diams.). *a*, First antenna (30 diams.); *b*, second antenna (15 diams.); *c*, maxilliped (30 diams.); *d*, *e*, *f*, and *g*, first, fourth, fifth, and seventh peraeopods (15 diams.); *h*, dactylus of fifth peraeopod (75 diams.).

segments. Coxal plates of second to fourth segments small, much shorter than the lateral margin of the segments; those of fifth to seventh larger and longer, extending back to well beyond posterior margins of the segments. Anterior three pairs of peraeopods stout, successively increasing in length backwards; last four pairs much more slender, increasing in length backwards, the fourth being much shorter than the first pair, and only about half the length of the seventh. Pleon composed of four segments and a single pair of short lateral grooves denoting a partly fused segment; first segment longer than second, which is twice as long as the very short third; terminal segment more than three times as long as first three segments together; lateral margins slightly converging for anterior half, thence roundly converging to the somewhat narrow apex, which is emarginate. Uropoda narrow; endopodite apically rounded, subacute.

Colour brown, with indistinct paler vermiculations; a median, longitudinal line on peraeon and greater part of length of pleon, and lateral edges of thoracic segments, sooty; a pale stripe on each side of mid-line of peraeon. Coxal plates, legs, apex of abdomen, and flagellum of both first and second antennae pale yellow. Underside pale brown. Uropoda yellow, with brown markings.

Length, 11 mm.

Hab.—South Australia: Marino Reef (W. H. Baker and H. M. Hale). (Type, South Aust. Mus., Reg. No. C235.)

In a specimen 8 mm. in length the abdomen is relatively less narrowed posteriorly.

This species approaches *Z. granulosa*, Heller, and *Z. tubicola*, Thomson, in that the extremity of the abdomen is notched. *Z. granulosa*, however, has five pleon segments, and *Z. tubicola* apparently has but three.⁽⁸⁾ *Z. phryganea* differs in the much shorter antennae and four-segmented pleon.

The South Australian specimens were found in short, hollow pieces of the stem of a marine plant, broken at one end just below a node, thus forming a tube with one end closed; the habit of this Isopod, and of a small Amphipod which was taken at the same time, recalls to mind some of our Caddis worms, which utilise, quite similarly, portions of plant stems. It is possibly owing to this method of concealment that the genus has not previously been noted in Australia.

⁽⁸⁾ Chilton, Trans. N. Z'd. Inst., xxii., 1890, p. 203.